

**SMART  
MATURE  
RESILIENCE**



FOR MORE  
RESILIENT  
CITIES IN  
EUROPE

**RISK SYSTEMICITY  
QUESTIONNAIRE USER MANUAL**

[www.smr-project.eu](http://www.smr-project.eu)

## OUR PARTNERS



**tecnun**  
Universidad  
de Navarra

[www.tecnun.es](http://www.tecnun.es)



UNIVERSITY OF AGDER

[ciem.uia.no](http://ciem.uia.no)



[www.strath.ac.uk](http://www.strath.ac.uk)

**li.u** LINKÖPING  
UNIVERSITY

[www.liu.se](http://www.liu.se)

**I.C.L.E.I**  
Local  
Governments  
for Sustainability

[www.iclei-europe.org](http://www.iclei-europe.org)



[www.kristiansand.kommune.no](http://www.kristiansand.kommune.no)



**DONOSTIA  
SAN SEBASTIÁN**

[www.donostia.org](http://www.donostia.org)



[www.glasgow.gov.uk](http://www.glasgow.gov.uk)



**vejle**  
KOMMUNE

[www.vejle.dk](http://www.vejle.dk)



[www.bristol.gov.uk](http://www.bristol.gov.uk)

**ROMA**

[www.comune.roma.it](http://www.comune.roma.it)



[www.riga.lv](http://www.riga.lv)



[www.din.de](http://www.din.de)



Funded by the  
Horizon 2020 programme  
of the European Union

This document has been prepared in the framework of the European project SMR – SMART MATURE RESILIENCE.

This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement no. 653569.

The sole responsibility for the content of this publication lies with the authors. It does not necessarily represent the opinion of the European Union. Neither the REA nor the European Commission is responsible for any use that may be made of the information contained therein.



# RISK SYSTEMICITY QUESTIONNAIRE **USER MANUAL**

## TABLE OF CONTENTS

INTRODUCTION .....	4
1. USING THE RISK SYSTEMICITY QUESTIONNAIRE: <b>A QUICK GUIDE</b> .....	6
Step 1: Opening the RSQ .....	6
Step 2: Completing the RSQ topics .....	7
Step 3: Checking the priorities .....	10
2. SUMMARY OF KEY POINTS .....	11
3. TECHNICAL REFERENCE .....	12
4. EXPECTED USES OF THE RSQ .....	20
5. APPENDIX A: ENABLING MACROS .....	21
6. APPENDIX B: EDITING SCENARIOS IN THE RSQ .....	23
7. APPENDIX C: MAPPING RISKS AND BUILDING RISK SCENARIOS .....	24

# RISK SYSTEMICITY QUESTIONNAIRE USER MANUAL

*“Resilience reflects the ability of systems to absorb and recover from shocks, while transforming their structures and means for functioning in the face of long-term stresses, change, and uncertainty. This **requires actively understanding the risk landscape**”  
(van der Vegt et al, 2015: 972)<sup>1</sup>.*

The Risk Systemicity Questionnaire (RSQ) has been developed as part of a H2020 funded project on Smart Mature Resilience<sup>2</sup> that has created a range of tools to assess and develop cities’ resilience. The RSQ seeks to support cities in “actively understanding the risk landscape” by improving their risk assessment beyond traditional methods through an innovative focus on the interactions between different types of risks. The RSQ has been co-created in close collaboration with representatives of seven European cities, and it presents a range of risk scenarios – perspectives of the future reflecting how one risk might cause others, thus presenting a ‘scenario’ of risks. By exploring a range of risk systemicity scenarios, the user is able to prioritise the high risk areas which may require particular attention. The RSQ enables cities to develop their knowledge of the risk landscape which affects them, thereby developing their resilience.

In contrast to traditional risk registers, the key advantage of using the RSQ is that it promotes a perspective on risks where risks are not seen as being independent from one another, but they form complex networks of interdependencies. A particular focus of the RSQ is on scenarios that are vicious cycles – scenarios that escalate and get worse. Such cycles can occur when the interdependencies between risks create feedback loops that reinforce themselves over time. Vicious cycles of risks are notoriously difficult to mitigate.

In order to tackle the risk systemicity scenarios identified as a priority for a city, the RSQ offers a range of possible mitigation actions – both tried and tested by at least one of the collaborating cities, as well as suggestions that might be considered. Using the RSQ, groups and individuals are invited to think more intentionally about the implications of risk systemicity for their city, and how to deal with its ramifications.

The RSQ is intended to support a group’s discussions regarding risks that are of importance to their city. Section 5 of this document describes a number of uses of the RSQ all of which involve the RSQ facilitating discussion amongst a range of stakeholders who have an interest in assessing and managing risks across a city. It should be noted that the intention of the RSQ is not to provide objective measures of risks. As a tool to facilitate discussion, it encourages users to think differently about risks, through interacting risk scenarios, and to consider the implications of these scenarios for their city.

The aim of this manual is to explain how to use the RSQ. This document is structured according to the following sections:

---

<sup>1</sup> Van Der Vegt, Gerben S., Essens, Peter, Wahlström, Margareta and George, Gerard. 2015. "Managing risk and resilience". *Academy of Management Journal*, 58(4): 971-980.

<sup>2</sup> [www.smr-project.eu/home](http://www.smr-project.eu/home)

Section	Title	Purpose
2	Using the Risk Systemicity Questionnaire: a quick guide	Explains key function of the RSQ
3	Summary of key points	Summary of key messages regarding recommended approaches for using the RSQ
4	Technical reference	Compliments the initial 'quick guide' section with a more detailed explanation of the functionalities of the RSQ
5	Uses of the RSQ	Approaches to using the RSQ in cities which target different user groups
6	Appendix A	Enabling macros in Excel
7	Appendix B	Editing scenarios in the RSQ
8	Appendix C	Mapping risks and building risk scenarios

# 1. USING THE RISK SYSTEMICITY QUESTIONNAIRE: A QUICK GUIDE

## STEP 1: OPENING THE RSQ

The RSQ has been designed so that it does not require any specific technical skills.

Open the RSQ in Excel, and the use of ‘macros’ has to be enabled (see Appendix ‘A’ – enabling macros).

On the starting page of the RSQ (Figure 1), the user can fill in basic information about themselves, and can also i) view

a demonstration how to enable macros (see Appendix for further information); ii) view the built-in user instructions, iii) clear all answers from this copy of the RSQ if it has been completed previously. It is also recommended to save the RSQ with a new file name so as not to overwrite the ‘master copy’ which can be used in future applications.

The screenshot shows the starting page of the Risk Systemicity Questionnaire. At the top, it says "RISK SYSTEMICITY QUESTIONNAIRE" and "A city resilience tool developed as part of Work Package 3". There is a logo for "SMR Smart Urban Resilience". Below this, there is a section titled "PLEASE WRITE YOUR DETAILS BELOW" with three input fields: "YOUR NAME:", "YOUR ORGANISATION:", and "YOUR FUNCTION:". To the right of these fields is a button labeled "RSQ instructions". Below the input fields, there is a warning: "Please answer the questions on the next sheets, and remember to enable macros in your copy of Excel! Macros need to be enabled in order to allow the various essential functionalities of the RSQ." At the bottom of the page, there are two buttons: "How to enable macros? (based on Office 2013)" and "Clear all answers from the RSQ (if completed before)".

This button allows you to access built-in instructions for using the RSQ.

This button clears all answers from the RSQ - it is useful when you want to clear a previously completed copy of the RSQ.

This button explains how to enable macros, but it is useful only when demonstrating it to others on a large screen. Otherwise see the instruction included in this document.

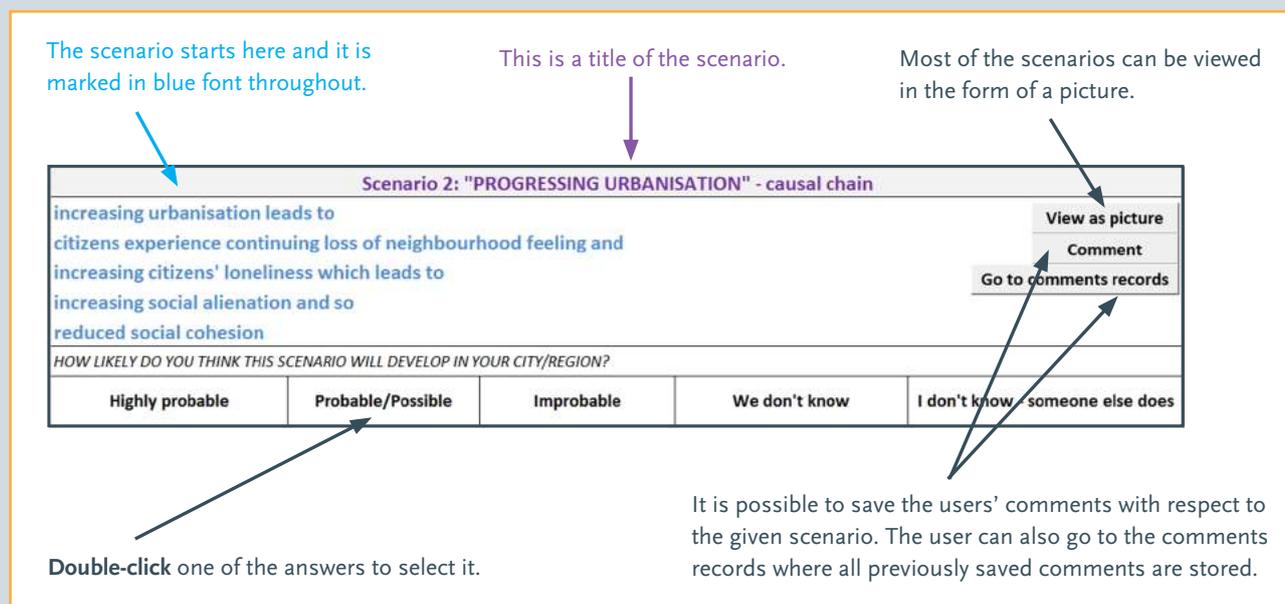
Figure 1: Starting page of the Risk Systemicity Questionnaire

## STEP 2: COMPLETING THE RSQ TOPICS

Select one of the Excel tabs which explore the **10 risk topics** that are covered in the RSQ. Depending upon the focus of the user group's discussion, you may wish to select particular risk topics that are of interest to the group, or complete all 10 risk topics.

Each of these topics comprises of a number of risk scenarios, and the user is asked to consider how likely these scenarios are to occur in their city (Figure 2). There are five possible responses to each scenario which can be chosen by double-clicking on the respective response:

- *Highly probable* – signifying a >60% chance of occurring
- *Probable/possible* - signifying a 20-60% chance of occurring
- *Improbable* - signifying a <20% chance of occurring
- *We don't know* – which means that no-one in the City, or in the project team who are the RSQ users, is likely to be able to answer this question.
- *I don't know but someone else does* - which means that the user does not know the answer to this question, but believes someone else in the City, or in the project team, is likely to be able to answer this question



The scenario starts here and it is marked in blue font throughout.

This is a title of the scenario.

Most of the scenarios can be viewed in the form of a picture.

Double-click one of the answers to select it.

It is possible to save the users' comments with respect to the given scenario. The user can also go to the comments records where all previously saved comments are stored.

Scenario 2: "PROGRESSING URBANISATION" - causal chain				
increasing urbanisation leads to citizens experience continuing loss of neighbourhood feeling and increasing citizens' loneliness which leads to increasing social alienation and so reduced social cohesion				
HOW LIKELY DO YOU THINK THIS SCENARIO WILL DEVELOP IN YOUR CITY/REGION?				
Highly probable	Probable/Possible	Improbable	We don't know	I don't know - someone else does

View as picture  
Comment  
Go to comments records

Figure 2: Example of a risk scenario in the Risk Systemicity Questionnaire

As seen in Figure 2, in addition to reading the risk scenarios as text, **a scenario can also be viewed in the form of a picture** (by clicking a 'view as picture' button). Some of the pictures represent causal chains of risks, while other pictures represent

self-reinforcing, closed vicious cycle (see section 5 for a more detailed explanation of the difference between causal chains and vicious cycles), and so pictures may assist in understanding better the structure of the given risk scenario.

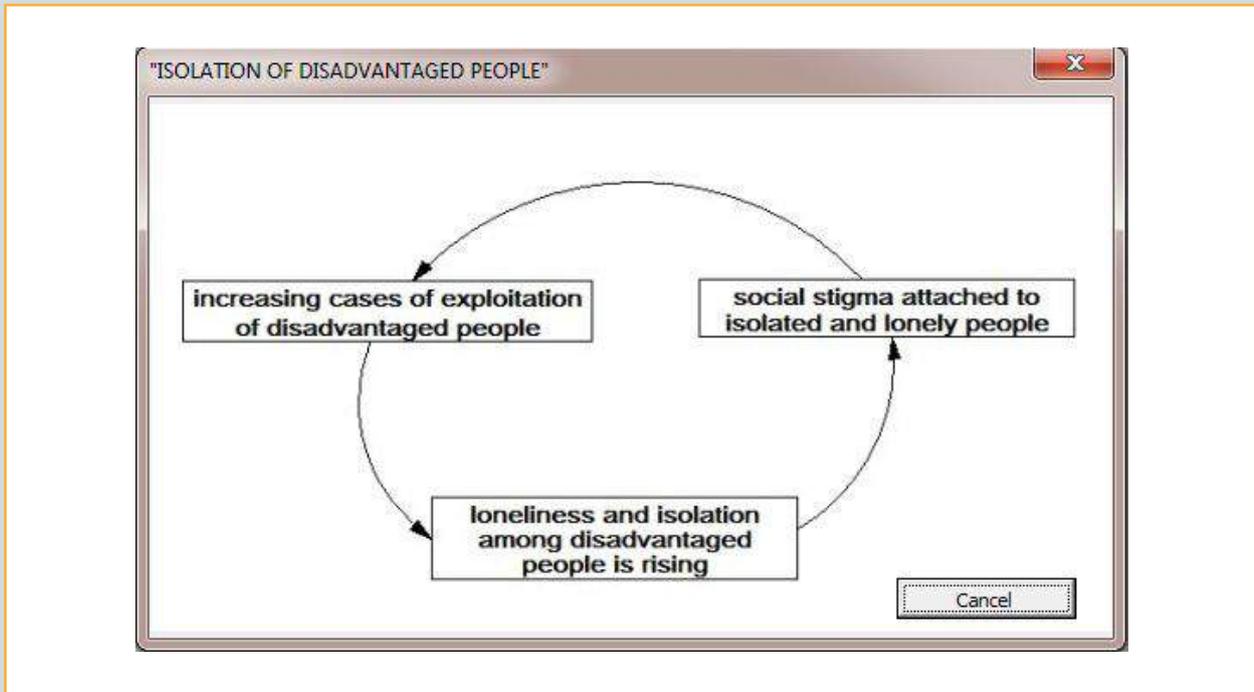


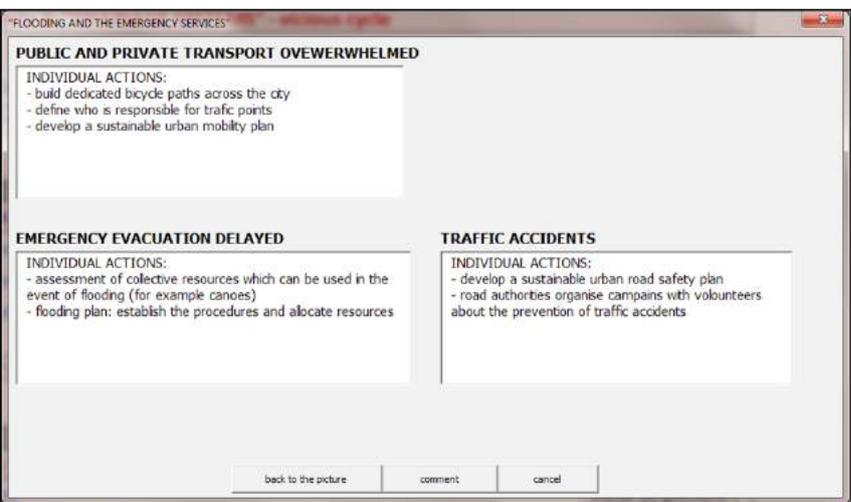
Figure 3: A picture of a vicious cycle in the RSQ

The **'comment'** button allows the user to save their own comments about the risk scenarios. All comments are stored on a separate 'comments record' page which can be accessed by clicking on the **'go to comments record'** button.

Upon completion of a given topic (tab), the user can click the **'see risk mitigating actions'** button at the bottom of the page. The user will then be taken back to the top of the topic, and, if mitigation actions are included, a new button (**'view mitigating actions'**) will appear for some of the risk scenarios which will

direct the user to a screen from where they can explore a portfolio of possible mitigating actions for that scenario (Figure 4).

**Editing scenarios** is possible. However, to avoid destroying the background programming in the RSQ it is necessary that lines in scenarios are not deleted. There are two ways of modifying scenarios: i) edit lines in a scenario (including making a line of a scenario blank), without changing the overall logic of a scenario, and ii) copying and pasting a scenario into a comment box and then editing it.



The screenshot shows a window with the following content:

- PUBLIC AND PRIVATE TRANSPORT OVERWHELMED**
  - INDIVIDUAL ACTIONS:
    - build dedicated bicycle paths across the city
    - define who is responsible for traffic points
    - develop a sustainable urban mobility plan
- EMERGENCY EVACUATION DELAYED**
  - INDIVIDUAL ACTIONS:
    - assessment of collective resources which can be used in the event of flooding (for example canoes)
    - flooding plan: establish the procedures and allocate resources
- TRAFFIC ACCIDENTS**
  - INDIVIDUAL ACTIONS:
    - develop a sustainable urban road safety plan
    - road authorities organise campaigns with volunteers about the prevention of traffic accidents

At the bottom of the window are three buttons: "back to the picture", "comment", and "cancel". To the right of the window, a red button labeled "View mitigating actions" is shown, which is the focus of the figure.

Upon completing each of the RSQ topics, a 'view mitigating actions' button will appear next to the relevant scenarios (right under the 'view as picture' button).

After clicking the 'view mitigating actions' button, you will be presented with a number of suggestions for risk mitigating actions with respect to the given scenario. You can copy those actions (using Ctrl+C shortcut) and paste them into the comment box (using Ctrl+V shortcut) which will allow you to edit and expand them.

Figure 4: Mitigating actions

### STEP 3: CHECKING THE PRIORITIES

The ‘**priorities**’ tab in the RSQ provides a ranking of the completed scenarios according to their assessed priority (Figure 5). This ranking automatically updates itself as new scenarios are being completed, and it does not require that all scenarios are completed – which means that, for example, the user may choose to complete two topics only and still

receive a priority ranking. These priorities are based on an analysis of i) the extent of the scenario’s ramification, and ii) their impact on key outcomes. They are intended only as a basis of a discussion that leads to a revised set of priorities that take account of local context.

Clicking on the **RANK** button ranks all the scenarios by their priority (this ranking is also triggered automatically when opening this page). In addition to this, it is also possible to sort the scenarios by the priorities added by the user.

By clicking on a given RSQ topic, the scenarios from all other topics will be hidden from the list.

It also possible to reveal or hide those scenarios which have not been attempted yet.

In this column the user can enter their own priority ranking based on their judgment.

Sort by:		Elderly   Social cohesion   Social alienation   Social inequalities   Flooding   Pollution						Hide 'no answer'	
<b>RANK</b>		Health   Integration   Public unrest   Infrastructure						Show all scenarios	
<b>PRIORITY RANKING OF ALL SCENARIOS</b>									
SCENARIO	TOPIC	USER ANSWER	RANKING	USER RANKING					
5/9: AGED CITIZENS' FEAR OF CRIME IN THE CITY	elderly/cohesion	we don't know	1						
8/8: MENTAL HEALTH AND LONELINESS	elderly/health	probable/possible	2						
10/9: HEALTHCARE UNDER PRESSURE	elderly/health	probable/possible	3						
2/4/4: PENSION AGE	elderly/cohesion/alienation	probable/possible	4						
9: ALCOHOL ABUSE	elderly	highly probable	5						
6/5/8: DIGITAL MARGINALISATION	elderly/soc. cohesion/alienation	i don't know	6						
4/6: SINGLE HOUSEHOLDS	elderly/alienation	i don't know	7						
7/3/7: DEMENTIA AND THE ELDERLY	elderly/inequalities/health	improbable							
3/7/5: FAMILY MEMBERS CO-LOCATION	elderly/cohesion/alienation	improbable							
11/6: SOCIAL WELFARE AND FAMILY SUPPORT	elderly/cohesion	improbable							

Figure 5: Priority ranking

## 2. SUMMARY OF KEY POINTS

Before starting to work with the RSQ, please be reminded of the following list of ‘key points’ which help to clarify the purpose of this tool:

- RSQ is primarily a tool for facilitating group discussions about RISK SCENARIOS, it is not a quantitative diagnostic tool.
- It is recommended to take notes using the comment box both when completing the RSQ as a group or as an individual. However, remember about the limit of 8000 characters (including spaces) for each scenario (8000 characters amount to about 2 pages of text – see section 4 for more information). When the 8000 words character limit in the comment box is exceeded through copy-pasting, a new comment will not be saved by the RSQ and the user will be notified about it.
- It is very likely that you will disagree with a part of some of the scenarios – a focus of the group discussion should be on how the scenarios do, or do not, fit with your city context. When you disagree with a scenario, the group should discuss how the scenario should be presented with respect to their city, and save these comments in the comment box.
- When completing the RSQ, you will find that some scenarios appear in more than one topic – for example the same scenario about air pollution may appear under the ‘air pollution’ topic and under the ‘health’ topic. However, it is sufficient to complete the scenario only once – all other ‘repetitions’ of that scenario will be completed automatically. These types of repetitions serves two purposes: i) each topic will necessarily include scenarios and causal links that are in other topics, which thereby points to the systemic nature of risks and ii) it is anticipated that users may want to tackle only one or two topics and so it is important to ensure that the individual topics cover all the relevant scenarios from the RSQ.
- The main benefit of using the RSQ is in supporting users, and especially user groups, in conducting interdisciplinary conversations about the systemicity of risks faced by their cities – that is how different types of risks interact with one another. These discussion are further supported by an ability to i) prioritise the risk scenarios, and ii) access suggestions for risk mitigating actions.
- Priorities are suggestions only, where the suggested priorities are based on an analysis of the impact of a scenario within the full context of all scenarios and therefore should be adjusted to the local context of the city
- There is no imposed timeframe for working with the RSQ, which means that it is expected that it is the users who will select an appropriate timeframe for themselves. Although this can be determined based on the specific context for which the RSQ is being used, during the construction of the RSQ the city partners have found a period of 3-5 years a usual timeframe to consider.

### 3. TECHNICAL REFERENCE

In this section you will find additional information regarding the features of the RSQ described in section 2 ‘a quick guide’, as well other technical information relevant to the use of the RSQ.

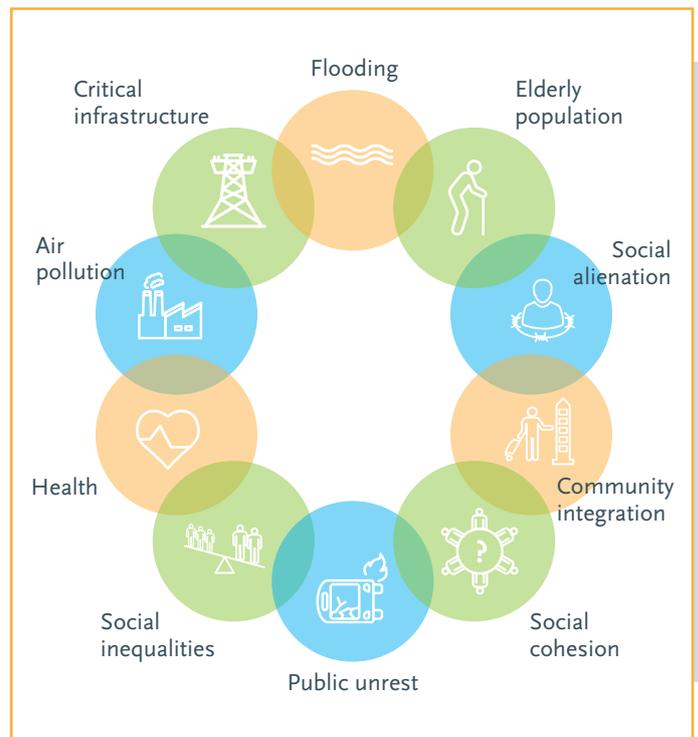
#### Computer requirements

The following are the recommended technical requirements for the machines running the RSQ:

- A ‘modern’ PC computer.
- MAC users are recommended to try using a PC emulator on their machines.
- Windows 7 operating system or later, and Windows must be fully patched and updated – especially with the Service Packs.
- MS Office 2013 or later, with Macros enabled in Excel (see Appendix).
- Avoid loading the RSQ from a pen drive – it is important that the file is transferred to a desktop before using the RSQ.
- Use a simple name for the RSQ file (e.g. “RSQ\_city”) and avoid any dots in the name (dashes are fine).
- When using old PC machines, in situations when the RSQ is already processing a task, the user is recommended to wait until the ‘processing’ icon of the mouse cursor is ready before proceeding to another command.

#### RSQ topics

The RSQ comprises of 10 topics which fall under the three broad themes of the Smart Mature Resilience project, and which are: social dynamics, climate change, and critical infrastructure. Each topic can be accessed in a dedicated Excel tab, and it consists of around 10-14 risk scenarios. These ten topics are:



Although the topics can be explored individually, they are not separate from one another. Indeed, interaction between risk scenarios occurs across risk topics. Such interactions result in some scenarios appearing in multiple RSQ topics (for example a scenario may appear both under ‘health’ and ‘air pollution’). However, the user is only asked to provide an answer to that scenario once – the same scenario which also appears in a different RSQ topic will then be completed automatically. Thus, the interacting scenarios allow chains of arguments which cross between different RSQ topics to be captured. This feature of the RSQ emphasises the importance of considering the interdependencies between risks. Note

that those scenarios which interact across the different tabs can be differentiated by the purple font of their headlines, whilst the remaining scenarios have red headlines.

In addition to this, some scenarios act as triggers for other scenarios. When a trigger scenario is answered as being 'improbable', then the scenarios which would otherwise follow from that 'improbable' scenario are disabled and effectively hidden from the RSQ. This feature applies particularly to the first scenario in each tab, which tends to be a 'general' scenario which asks whether the given topic is of relevance to the user (e.g. 'is your city subject to increased social alienation?'). For these kinds of scenarios, upon given an 'improbable' answer, the entire topic is disabled, and the user can proceed to spending time on other topics which may be of higher relevance to them.

### Risk scenarios: causal chains and vicious cycles

All elements of risk scenarios are linked causally, which means that one risk can lead to another risk – as when, for example, 'flooding disrupts the transportation system and also causes an increased number of traffic accidents in the region, which also constrains the mobility of citizens and emergency

services'. Therefore, each scenario describes a chain of risk events and some of these chains of events form vicious cycles as seen above in Figure 3. The characteristic feature which distinguishes vicious cycles from other types of causal chains is that vicious cycles tend to have a self-reinforcing nature.

For example, in Figure 6 is presented a causal chain where 'family members live increasingly far away from one another' and 'parents separate', which both lead to 'personalisation and individualisation of peoples' lifestyles in the modern age', which then leads to 'continued increased in single households', leading to 'isolation and loneliness of working age people', which means 'a continuous loss of neighbourhood feeling', and the causal chain finally ends on 'increasing loneliness of the elderly'.

In comparison to the causal chain in Figure 6, in Figure 7 is depicted a vicious cycle. In that picture, 'increase in the aged peoples overall health problems' leads to 'city faced with a significantly growing demand for increased health care and social care', leading to 'health services are under increasing pressure', which means that 'the quality of health services is reduced'. However, instead of the scenario ending on that last risk, it goes back to, and thus reinforces, the initial trigger 'increase in the aged peoples overall health problems'.

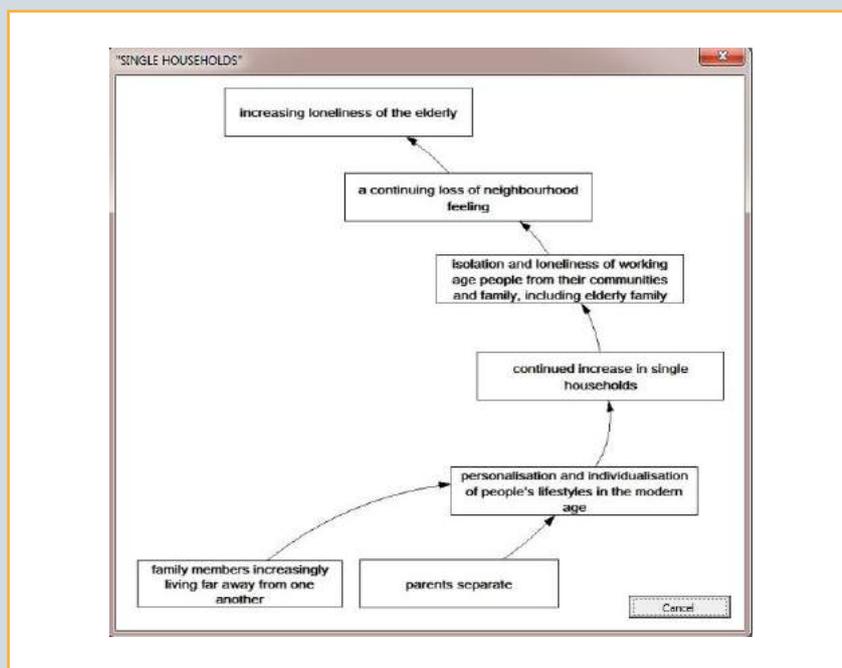


Figure 6: A picture of a causal chain in the RSQ

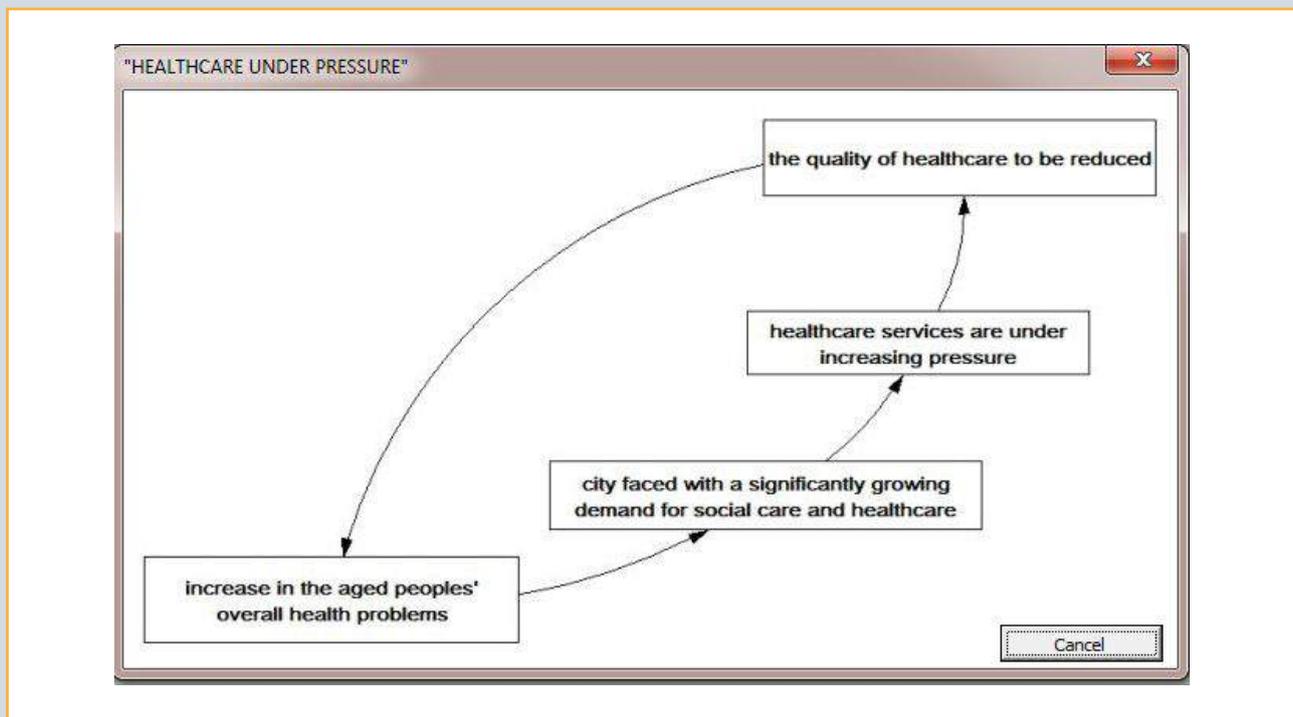


Figure 7: A picture of a vicious cycle in the RSQ (second example in this document)

The reason why vicious cycles are important is because i) they are often difficult to identify and ii) they are difficult to deal with. There is no defined beginning or end to a vicious cycle and so you need to consider which of the different elements of the vicious cycles need to be addressed in order to tackle the cycle. In contrast, with regards to causal chains, addressing the trigger, or the elements close to the trigger, may provide an effective way of resolving the risk scenario. The RSQ therefore plays an important role in helping users appreciate the nature of various types of vicious cycles which may target their city.

#### Comment box

Another key feature of the RSQ is that the user can save comments, which can for example be a summary of the group discussion, and can be later accessed and edited (Figure 8). Saved comments are automatically transferred to a separate comments record where the user can easily navigate between

the previously added comments (Figure 9). This feature enables a summary of any discussion that occurred when completing the RSQ to be captured alongside the scenarios, which prompted the discussion, providing a record of the most important aspects of the discussion.

The comment box can be accessed by clicking a **'comment'** button next to each scenario, or when viewing the risk mitigating actions which are explained in the next subsection. As shown in Figure 8, the comment box comprises of the following elements.

- A text box where the user can enter their text (CTRL+C and CTR+V short cuts work here respectively for copying and pasting text).
- **'Save'** button which saves the comment in a separate comments record. Clicking the 'Save' button does not close the comment box.

- **'Cancel'** button which closes the comment box.
- A box showing the current number of entered characters for the given scenario in the comment box. There is a limit of 8000 characters (including spaces) which can be added to the comment box, and that is equivalent to approximately 2 pages of text. When the 8000 words character limit in the comment box is exceeded through copy-pasting, a new comment will not be saved by the RSQ. For this reason, try to avoid copy-pasting long texts from external sources into the comment box.



Figure 8: Comment box

Next to each scenario there is also a **'go to comments records'** button which takes the user to the comments record where all the previously saved comments are stored. The comments record is a separate tab in Excel (see Figure 9). At the top of that page there is a navigation bar with buttons which, upon clicking them, will scroll down the page to the relevant topic. The comments record represents the structure of the RSQ, with the 10 topics comprising of a number of risk scenarios. The risk scenarios can be identified by their headlines, and each scenario has a text box with any previously saved

comments (if applicable) which can be edited. The existing comments in the comments record can be edited, but it's better to avoid adding long texts in the comments record rather than in the comment box in order to avoid exceeding the 8000 character limit. In addition to this, each scenario in the comments record has a **'go to the scenario'** button which takes the user from the comments record to the original scenario in the RSQ topic. This way, the user can conveniently navigate between the scenarios in the RSQ and the comments record throughout their use of the RSQ.

Navigation

---

**User's comments**

ELDERLY POPULATION		
Scenario 1: "AGEING"	Scenario 2: "PENSION AGE"	Scenario 3: "FAMILY MEMBERS CO-LOCATION"
Scenario 4: "SINGLE HOUSEHOLDS"	Scenario 5: "AGED CITIZENS' FEAR OF CRIME IN THE CITY"	Scenario 6: "DIGITAL MARGINALISATION"
Scenario 7: "DEMENTIA AND THE ELDERLY"	Scenario 8: "MENTAL HEALTH AND LONELINESS"	Scenario 9: "ALCOHOL ABUSE"
Scenario 10: "HEALTHCARE UNDER PRESSURE"	Scenario 11: "SOCIAL WELFARE AND FAMILY SUPPORT"	
CLIMATE CHANGE: AIR POLLUTION		
Scenario 1: "AIR POLLUTION"	Scenario 2: "COLDER WINTERS AND CLIMATE CHANGE"	Scenario 3: "HOTTER, DRIER SUMMERS AND CLIMATE CHANGE"

Figure 9: Comments record

### Risk mitigating actions

In addition to exploring the risk scenarios, for some of the scenarios it is also possible to view the suggestions for mitigating actions. As explained above in relation to Figure 4, the user can click the **'see risk mitigating actions'** button at the bottom of the page of the given RSQ topic. The user will then be taken back to the top of the topic, and, if mitigation actions are included, there will appear a new button (**'view**

**mitigating actions'**) for each risk scenario which directs the user to a picture of the risk scenario in question, but with an addition of **'see actions'** button (Figure 10) which direct the user to a portfolio of suggestions for risk mitigating actions for that scenario (Figure 11). It is worth noting that whilst exploring the risk mitigating actions, it is possible to save comments in the comment box, which can for example include copy-pasting the risk mitigating actions of interest and then editing them to make them more relevant to the user's city.

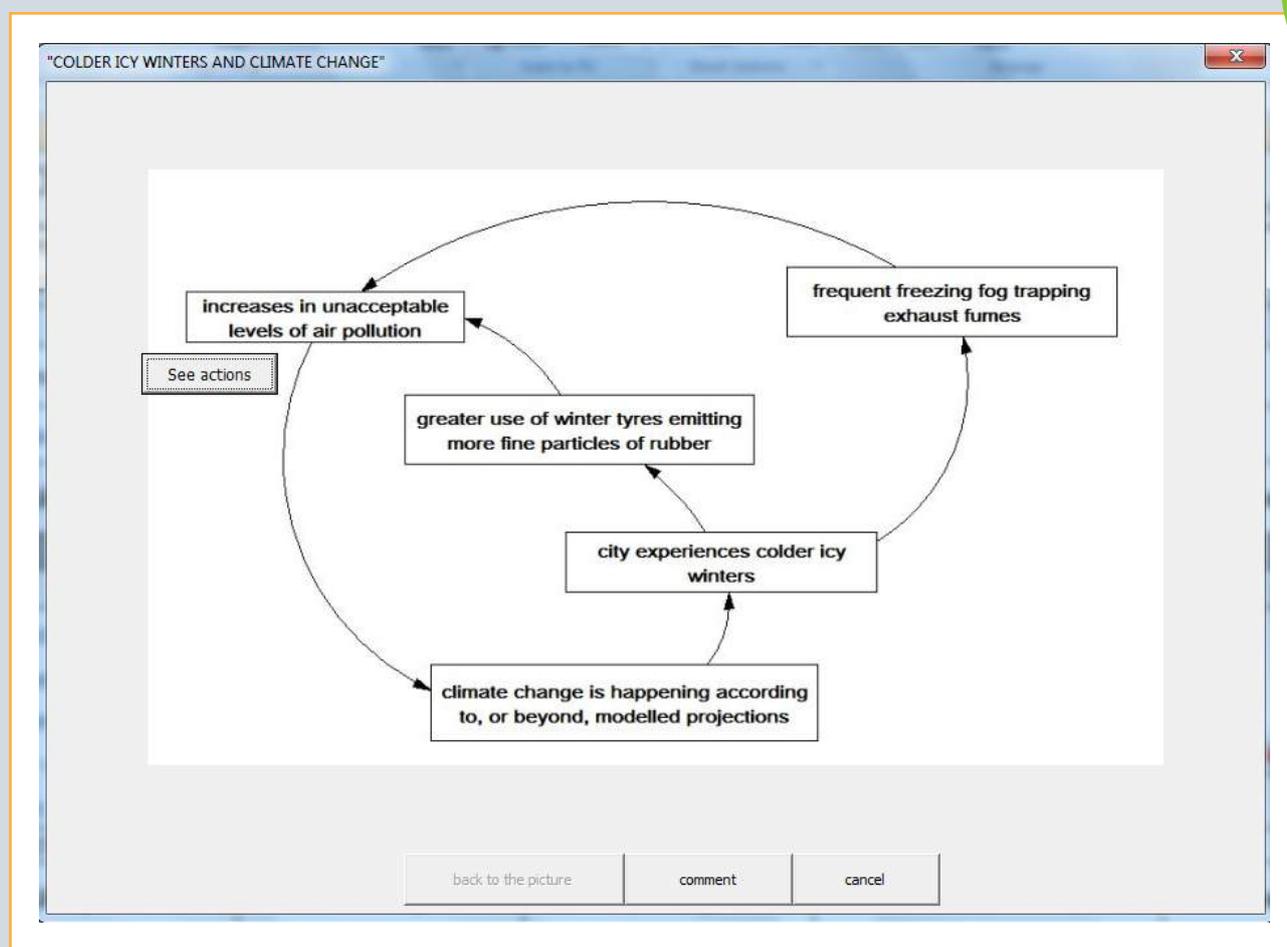


Figure 10: Picture of a risk scenario with an option to see the risk mitigating actions

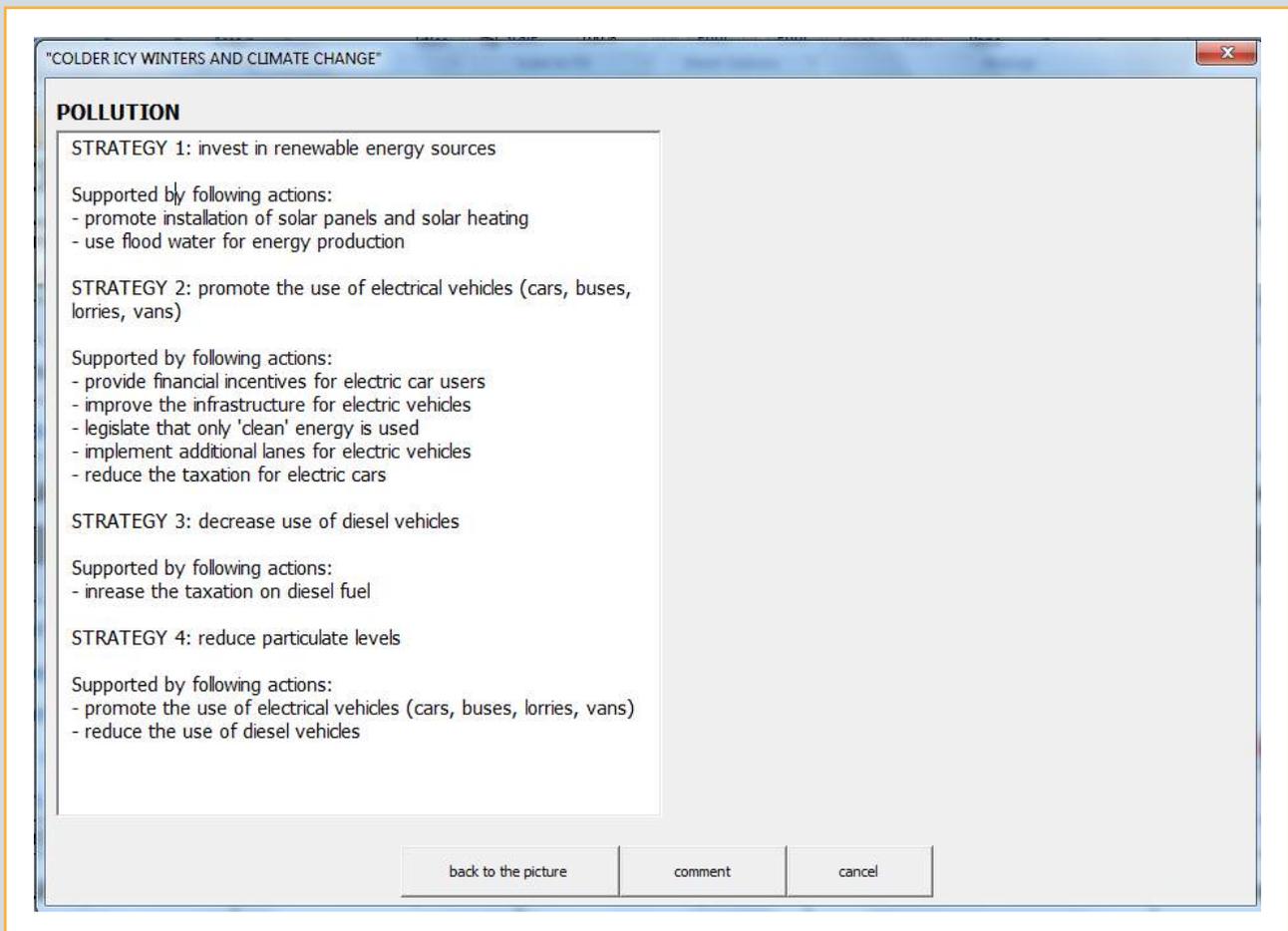


Figure 11: A portfolio of risk mitigating actions for an element of a risk scenario

### Priorities

The completion of risk scenarios results in the generation of a priority ranking of scenarios which is automatically updated as the user continuously provides responses to more scenarios. The ranking of priorities of scenarios does not require that all scenarios are completed – which means that, for example, the user may choose to complete two topics only and still receive a priority ranking. These priorities are based on an analysis of i) the extent of the scenario's ramification, and ii) their impact on key outcomes. They are intended only as a basis of a discussion that leads to a revised set of priorities that take account of local context. It therefore needs to be emphasised that these priorities are not intended to serve as a form of quantitative diagnostic assessment of risks, but rather as a point of reference for interdisciplinary communication and sharing of knowledge.

As shown above in Figure 5, the priorities tab in the RSQ comprise of a number of elements. Each time the user opens the priorities tab, the ranking of priorities is immediately updated. All of the attempted scenarios are then ranked according to their priorities, with a rank of 1 signifying the possible highest risk. The scenarios which have been answered as being 'improbable' do not receive a priority ranking.

However, in addition to viewing the ranking of priorities, the user has a number of options to choose from. Firstly, in the navigation bar at the top of the screen, the user can click on one of the 'sort' buttons representing the RSQ topics which hides all of the scenarios from the ranking which do not belong to the chosen topic. Secondly, the user may go back to the original ranking of all scenarios by clicking

the **'RANK'** button. Thirdly, the user may click on the **'hide no answer'** button to hide those scenarios which have not been answered yet, and thereby simplify the current view. Fourthly, it is possible to show again all of the previously hidden scenarios by clicking the **'show all scenarios'** button. And fifthly, in the column **USER RANKING** (which is on the right side to the original **RANKING**), the user may enter their own ranking of scenarios based on their own judgment. The scenarios can subsequently be ranked according to the

user's own ranking by clicking on the **'USER ranking'** button on the left side of the 'sort by' navigation bar at the top of the screen.

Finally, it must also be emphasised that hiding the attempted scenarios from the ranking using the 'sort' buttons does not exclude those scenarios from ranking, but it only hides them from the display. The visible scenarios will therefore retain their original ranking.

Clicking on the **RANK** button ranks all the scenarios by their priority (this ranking is also triggered automatically when opening this page). In addition to this, it is also possible to sort the scenarios by the priorities added by the user.

By clicking on a given RSQ topic, the scenarios from all other topics will be hidden from the list.

It also possible to reveal or hide those scenarios which have not been attempted yet.

In this column the user can enter their own priority ranking based on their judgment.

Sort by:				
RANK	Elderly	Social cohesion	Social alienation	Social inequalities
USER ranking	Health	Integration	Public unrest	Infrastructure
				Hide 'no answer'
				Show all scenarios
<b>PRIORITY RANKING OF ALL SCENARIOS</b>				
SCENARIO	TOPIC	USER ANSWER	RANKING	USER RANKING
5/9: AGED CITIZENS' FEAR OF CRIME IN THE CITY	elderly/cohesion	we don't know	1	
8/8: MENTAL HEALTH AND LONELINESS	elderly/health	probable/possible	2	
10/9: HEALTHCARE UNDER PRESSURE	elderly/health	probable/possible	3	
2/4/4: PENSION AGE	elderly/cohesion/alienation	probable/possible	4	
9: ALCOHOL ABUSE	elderly	highly probable	5	
6/5/8: DIGITAL MARGINALISATION	elderly/soc. cohesion/alienation	I don't know	6	
4/6: SINGLE HOUSEHOLDS	elderly/alienation	I don't know	7	
7/3/7: DEMENTIA AND THE ELDERLY	elderly/inequalities/health	improbable		
3/7/5: FAMILY MEMBERS CO-LOCATION	elderly/cohesion/alienation	improbable		
11/6: SOCIAL WELFARE AND FAMILY SUPPORT	elderly/cohesion	improbable		

Figure 5: Priority ranking

## 4. EXPECTED USES OF THE RSQ

As emphasised throughout this document, the RSQ is intended as a tool for facilitating interdisciplinary group discussions about risk systemicity and resilience in cities. It is therefore recommended to use the RSQ as part of a facilitated workshop with groups. The facilitator will ideally be a team member or a manager, and needs to be familiarised with the RSQ. The typical RSQ workshop may consist of the following phases:

**Phase 1:** The group should agree on the RSQ topics that are relevant to them. The process starts with a facilitated small group meeting in which a facilitator/leader/manager helps the group to collectively complete the relevant RSQ topics. For each risk scenario within each topic, the facilitator reads out the headline of the scenario and then reads out the text of the scenario – it may be useful to display the corresponding picture of the scenario. The facilitator invites the group to discuss the scenario and consider collectively what response they may want to give to the scenario. The summary of the discussion can be saved in the comment box, including any disagreements with a part of the scenario, and ideas for new, related risk scenarios that are more relevant to the city's context. This stage is expected to help develop consensus, raise consciousness about risks, and to flush out different perspectives on risk assessment and resilience.

**Phase 2:** Having completed a full RSQ topic, the facilitator scrolls down the page and clicks on the 'see mitigating actions' button. The group is then invited to consider the available risk mitigating actions, and reflect on whether they could add some new risk mitigating actions, which can then be saved in the comment box.

**Phase 3:** The group investigates the priority ranking page and discuss the results. The facilitator may encourage the group to consider adding their own ranking in the dedicated column provided, and compare the group's own ranking with the ranking generated by the RSQ.

These three described phases can be used with any of the following uses of the RSQ, albeit due to the characteristic of the group the main focus of the discussions may vary. Typical user groups are:

Use 1 - Resilience Office Team: The RSQ could be used regularly by the resilience office team to monitor the changing impact of risk scenarios on the city's resilience strategy. The RSQ could help to identify those areas of the city that require most attention with respect to resilience and thus help the team prioritise limited resources.

Use 2 - Project Teams: The RSQ may prove useful for teams that are working on city projects that bring together a range of stakeholders from across the city. The RSQ could be used at the beginning of a project in order for the team to think differently about risks that may impact the success of their project.

Use 3 – Politicians: The RSQ can be introduced to politicians as a way of encouraging them to discuss long-term risks that can influence their City. The discussion involved in completing the RSQ is likely to raise a general awareness of risky futures and help promote a focussed discussion of policy priorities.

Use 4 - City stakeholders: The RSQ can be used as a way of consciousness raising among a wide set of city stakeholders – particularly a mixed group of representatives of key NGOs. The RSQ would be the basis for focus group meetings involving, for example, pressure and voluntary groups seeking to help the city become more resilient. In particular, given the significance of social cohesion as a force for making a city more resilient, the RSQ could be used to promote discussion about the potential risks to social cohesion.

## 5. APPENDIX A: ENABLING MACROS

It is necessary when the RSQ to have the ‘macros’, which are customised programs, enabled in your version of Excel. This can be done by following six steps (based on MS Office 2013). Firstly, click on ‘FILE’ in the top left corner of your screen (Figure 12). Secondly, click ‘Options’, go to ‘Trust Centre’, and click ‘Trust Centre Settings’ (Figure 13). Thirdly, select ‘Macro Settings’ and tick ‘Enable Macros’ (Figure 14).

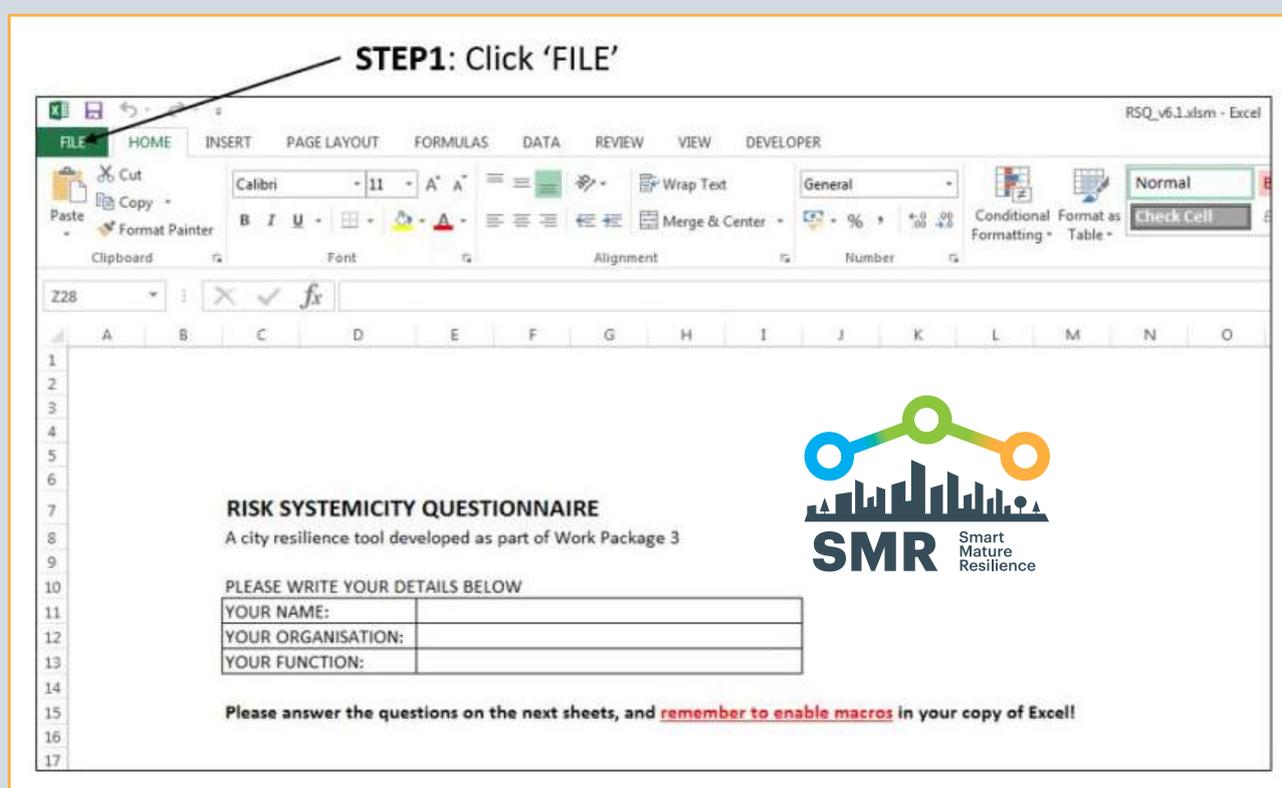


Figure 12: Enabling macros (part 1)

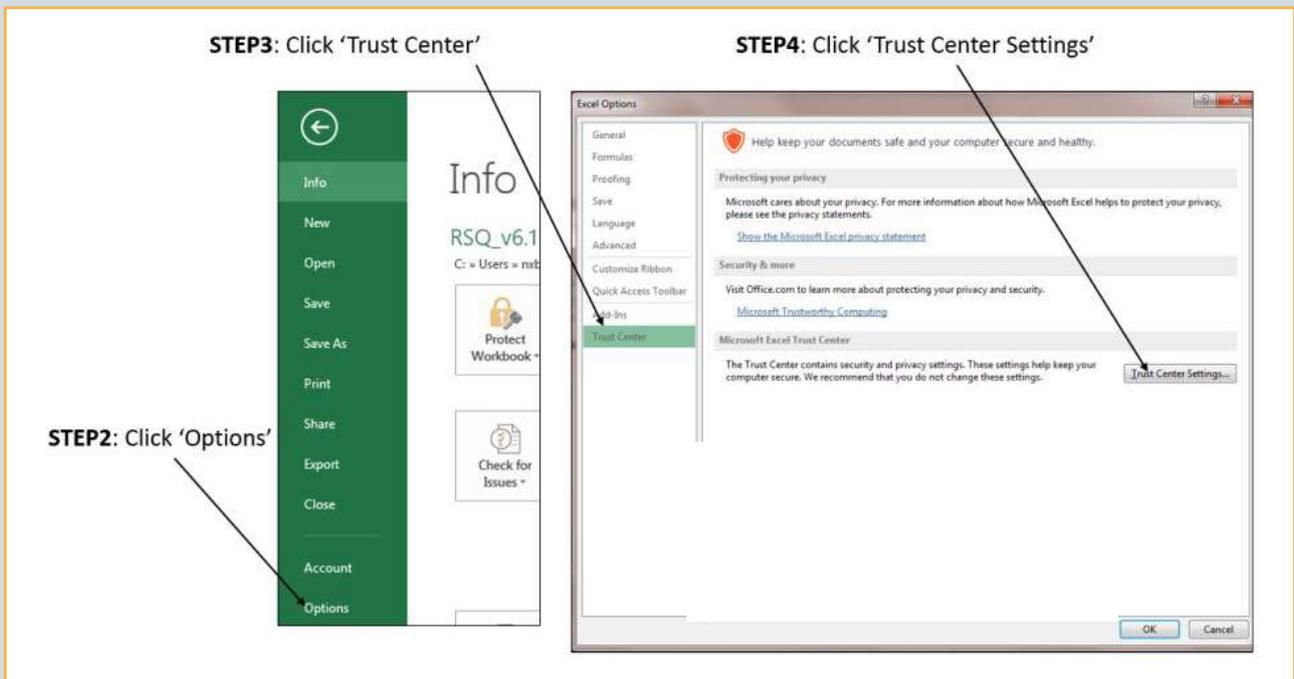


Figure 13: Enabling macros (part 2)

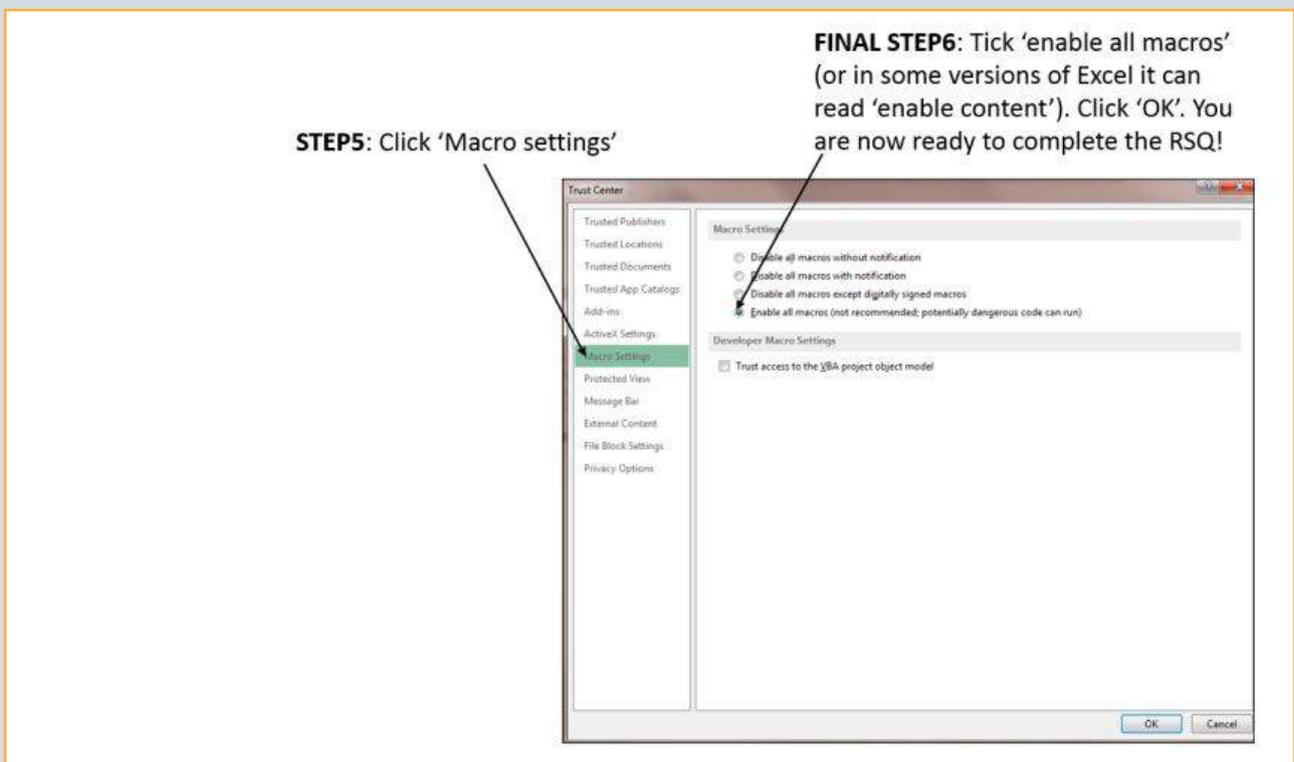


Figure 14: Enabling macros (part 3)

## 6. APPENDIX B: EDITING SCENARIOS IN THE RSQ

Scenarios in the RSQ can be edited by changing the text in the scenario. The text in the scenario can also be deleted and rewritten by the user (Figure 15). Also the headlines of the scenarios can be edited. However, the following rules need to be followed in order to avoid damaging the background programming which operates the RSQ:

- Do not change the number of rows.
  - If you want to make the scenario shorter, then keep the existing 'extra' rows empty.
  - If you want to make the scenario longer, then write two or more lines of the scenarios in one row. The text of the scenario can cross the original border of the table where the scenario is included.
- If you change the meaning of the scenario significantly, then the priorities assigned to this scenario may no longer be relevant.

Scenario 2: "COLDER WINTERS AND CLIMATE CHANGE" - vicious cycle				
				<a href="#">View as picture</a>
				<a href="#">Comment</a>
				<a href="#">View mitigating actions</a>
HOW LIKELY DO YOU THINK THIS SCENARIO WILL DEVELOP IN YOUR CITY/REGION?				
Highly probable	Probable/Possible	Improbable	We don't know	I don't know - someone else does

Figure 15: Editing scenarios

## 7. APPENDIX C: MAPPING RISKS AND BUILDING RISK SCENARIOS

If the group wishes to develop some city specific risk scenarios, then the following material describes a process for doing this.

The material in this Appendix has been extracted and modified from Bryson, John M.; Ackermann, Fran, and Eden, Colin. *Visual Strategy*. San Francisco: Wiley; 2014.

The main objective of risk mapping is the creation of important risk scenarios that describe possible risky futures for a City. However the mapping process also seeks to address process issues. Risk mapping helps keeps groups of people from talking over one another and going around in circles (see the cartoon below). It helps keep groups from being unclear and confused in their reasoning, unable to listen to one another, and unable to agree. Instead, risk mapping helps people speak and be heard, produce lots of ideas and understand how they fit together, make use of causal reasoning, and clarify ultimately what they want to do in terms of strategies, and actions. Risk mapping join process and content in such a way that good ideas worth implementing are found and the agreements and comments needed to implement them are reached.

Determining who should attend the workshop is an important key to success. A balance needs to be struck between having sufficient participants to allow for a diversity of views – while not also having so many views that air time for each person is limited. We recommend around 5-7 participants.

### Eliciting risks

The starting point has to be: *What do we think are the important risks that the City faces in the field of xxx?*

But, what is risk? The European Commission's staff working paper on Risk assessment and mapping guidelines for

disaster management<sup>3</sup> describes a risk as a function of the probability of occurrence of a hazard, the exposure (total value of all elements at risk), and the vulnerability (specific impact on exposure). Risk = hazard impact \* probability of occurrence.

However we recommend using a broader description: a risk can be any outcome in the future that represents a hazard, disaster, catastrophe, or crisis for the City.

Perhaps, one person thinks a risk the City is facing is: "drainage".

But this doesn't tell us much. The statement doesn't say enough to let us know what the nature of the risk is – meaning what is it that makes "drainage" a disaster.

There is a need for more words, such as: "drainage system gets blocked".

This now tells about a possible event in the future. The extra words help express more about the concern.

Sometimes two risks are embedded in one statement. For example, someone might say, "drainage system gets blocked and so roads become blocked" The "and" here indicates two separate ideas.

The best way to see the set of risks that participants see facing the City is to write them in rectangles rather than as lists and so spread them around so that all can see them. So, we use rectangular 'stick-notes' or better still use sticky 'ovals'<sup>4</sup>.

See Figure 16 for an example of the early stages of a risk dump in answer to the question "*What do we think are the important risks that the City faces in the topic of traffic management?*"

<sup>3</sup> The European Commission. 2010. „Commission staff working paper: Risk assessment and mapping guidelines for disaster management“; retrieved from: [https://ec.europa.eu/echo/files/about/COMM\\_PDF\\_SEC\\_2010\\_1626\\_F\\_staff\\_working\\_document\\_en.pdf](https://ec.europa.eu/echo/files/about/COMM_PDF_SEC_2010_1626_F_staff_working_document_en.pdf)

<sup>4</sup> <http://banxia.com/ovalmap/> 'ovals' help a group to see connections between risks whereas 'sticky-notes' tend to encourage seeing columns and rows

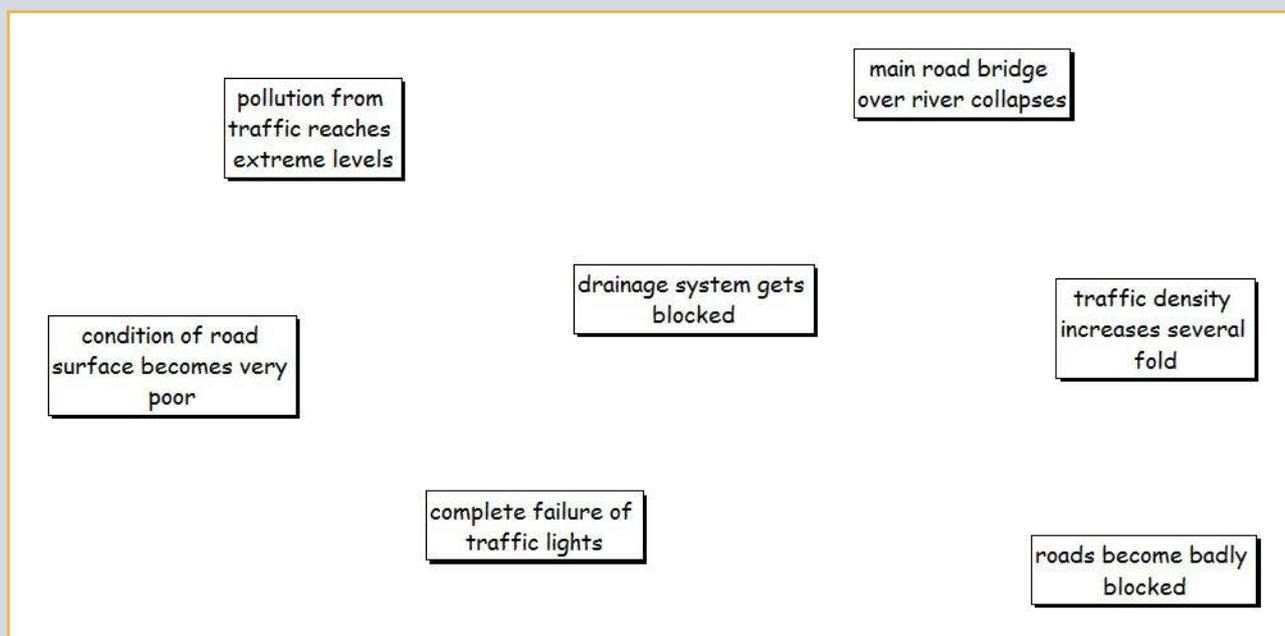


Figure 16: An early dump of risk relating to traffic management

The sticky-notes or ‘ovals’ should be placed on flip-chart sheets on a flat wall. Typically 6 flip-chart sheets are required set out in a 3x2 format (3 across and 2 down).

The group should be encouraged to dump risks until it is clear that participants have exhausted possibilities. In practice a group can often identify up to 50 risks before they ‘run down’ and also the map on the wall becomes overwhelming.

#### Building risk scenarios – adding causal links

An arrow is used to represent a causal link. The arrow implies “may lead to” or “may cause” or “might result in.” For example, in Figure 17 below, the arrow indicates the “and so” in the statement “drainage system gets blocked and so roads become blocked”.

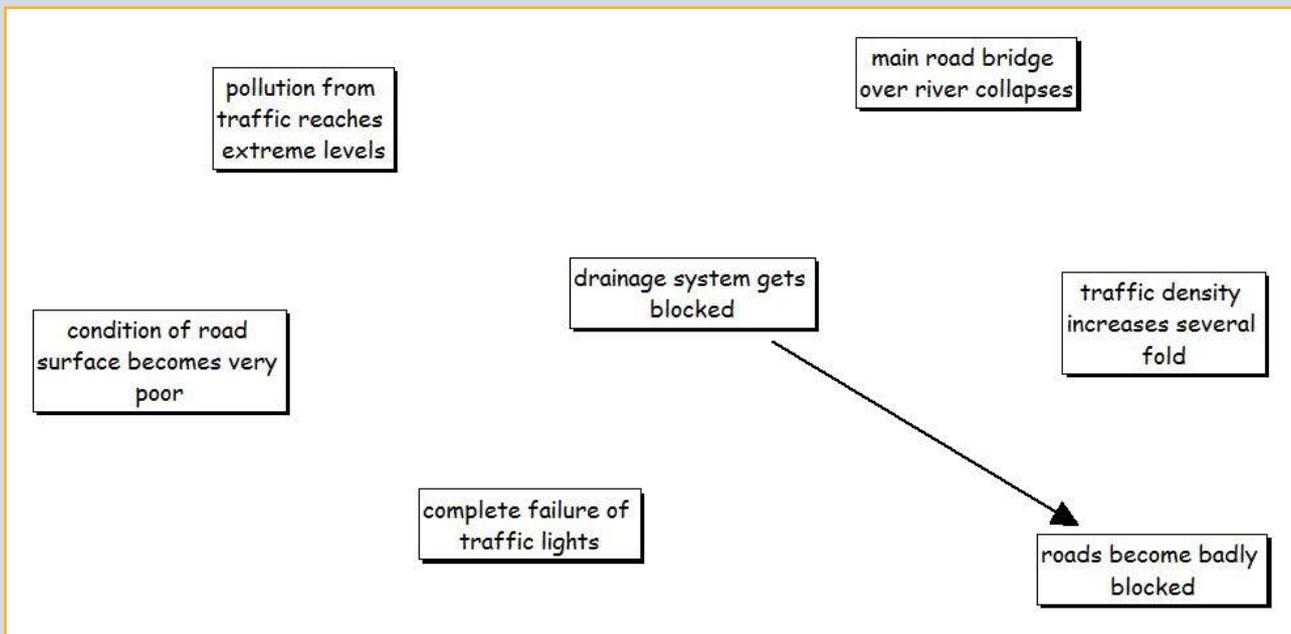


Figure 17: Causal links are shown by an arrow leading from one risk to another. The arrow shows the direction of causality: a blocked drainage system CAUSES roads to become badly blocked

Thus, the next step in creating risk scenarios is to get the participants to draw in the arrows they believe exist – show where they believe one risk causes another.

There is a danger of having the arrow point the wrong way and thus not express an action leading to an outcome. Thus, in a chain of arrows, the bottom of a chain of arrows (the first statement in the chain) is taken as the triggering risk.

It is easy to get the direction of arrows wrong by confusing chronological relationships with causal relationships.

Alternatively, thinking in terms of *if – then* statements can help get the causality right. For example, *if* we “[overcome] lack of good signposting,” *then* “people [will be] able to use our website effectively.”

As the risk map develops it will become messy (a lot of causal links). One way of creating a less messy initial causal

map is to avoid drawing in long links by instead drawing in a short arrow that does not go to the distant statement to which the first statement is linked, but instead points to the number of the statement written in at the end of the short arrow.

For example if one risk statement was to link to another risk statement on the opposite side of the map then adding a reference number to these ‘stick-notes’ enables a very short arrow out of the first risk and a short arrow in to the second risk. For example, the risk numbered 45 to the one numbered 23. However, while this is apparently less messy it can impede seeing the emergent structure and some of the interesting insights that emerge.

Often a coffee break is required to allow the facilitator to ‘tidy up’ the risk map by redrawing it on another set of flip-charts (or alternatively using mapping software).

This is why ‘tidying up’ by remapping the material can be helpful. In order to do so, however, a break in the workshop (perhaps for coffee) usually will be required so that the facilitator and one or two participants can do the remapping.

Risk Scenarios can now be identified. The important scenarios are vicious cycles – because these are much more difficult to mitigate than chains of risks. Vicious cycles usually require concerted strategies to attack many of the elements (risks/ events) that make up the cycle.

Risk scenarios are therefore: vicious cycles and causal chains that suggest a risk ‘story’ of significance to the city. The causal chain scenarios will usually consist of 6-10 events that are causally related, and have a triggering event (which could be the outcome from another scenario) and an outcome that represent a summary for the scenario and also represents an outcome that obviously matters to a strategic arena within the city overall strategy for the future.

### Vicious cycles

Vicious cycles occur when there is circular causality, which in a map shows up as a circle of arrows. These cycles, or feedback loops, are an important means of identifying priority risk scenarios. The feedback loop can represent either a “vicious” or “virtuous cycles.” In risk assessment the loops will usually be vicious cycles – that is the situation/scenario gets continuously worse over time.

Sometimes feedback loops can be counterintuitive, so that without seeing them on a map nobody is aware of their effect on the future of the City. Loops also can just be hard to see on a big map. When identified, however, loops are always worth exploring as they can be particularly problematic for a city with the scenario getting continuously worse over time.

### Facilitating a risk workshop

One particularly helpful way to get started is to jointly facilitate a risk workshop with a colleague. This allows for a sharing of effort. Managing the volume of material that can be generated (the content) as well as the group and its interactions (the process) is demanding. For first time facilitators, the demands can be too great if the stakes are high and the group is new to the facilitator. Working together also allows for sharing of experiences and therefore accelerated learning. It is also more fun and can tap into different competences, skills and knowledge bases. However, when working in pairs,

be clear about who is taking the lead at any one time (this might change over the course of the workshop), as this will avoid the danger of pushing in different directions or tripping over one another.

One of the real tensions for a facilitator in working with groups undertaking risk mapping is knowing when to finish with particular mapping tasks, for example, when to stop generating material, linking material, or tidying material up and identifying risk scenarios. Sometimes it will help to break the workshop into several small workshops so that the facilitators have time to ‘regroup’ and assess the material.

It is worth keeping in mind the Pareto Principle or the 80 – 20 rule. In this case, the rule suggests that 80 per cent of the work can be achieved in 20 per cent of the time and that successive elaborations and refinements can continue *ad nauseam* and not be very productive. Do not feel that you have to get everything perfectly right in terms of content. If there is time at the end of a workshop it is always possible to return to material that has been underexplored.

The attention facilitators pay to the workshop setting, equipment needs, and logistics can appear to non-facilitators as an excessive focus on what appears to be trivial concerns. Experienced facilitators know that getting the apparently trivial right can greatly increase the chances of success at very little cost. Developing your own facilitation *kit box* can be helpful. For risk workshops, lots of flipchart sheet paper; bullet-tipped, water-based flip chart marking pens (for writing up the issue statements and for drawing in links on the map); pencils (for drawing in tentative arrows); pads of sticky-notes (in possibly of two or three colours); a digital camera or another way to take photographs; etc. Ensuring there is plenty of everything is important, since running out is embarrassing, but more importantly means the workshop is not nearly as productive and mindful of participants’ time as it should be. In addition, make sure each participant gets the same colour pens since this will help separate proponents from their ideas about risks. In addition, make sure that the pen has a broad enough tip that participants will be forced to write in large text that it is easy for others to read.

One of the biggest mistakes that can be made is planning for a strategy workshop is not arranging to reserve the right room for workshop. Getting the room design right is fundamental. Be sure to visit the room well in advance of the workshop to make sure it is appropriate and to make sure there is plenty of time to seek an alternative, if necessary. A good room will

have plenty of wall space to which two rows of at least four flipchart sheets per row may be affixed with masking tape at the top of the upper row. This means walls with no fixed pictures, no textured wall paper, and no wall panelling or rail half way up the wall. Very large windows *without mullions* can be used for creating a mapping surface. Plenty of daylight is also helpful as this helps keep participants motivated and engaged (although note that too much sun can cause

discomfort). Avoid rooms with fixed heavy tables, particularly boardroom tables; heavy chairs; and many bookcases, since this will make it difficult to have participants seated in a semi-circle in front of the mapping surface. Too much heavy furniture will also make it difficult for participants to move around easily. Having comfortable (but not too comfortable) chairs on casters allows for good movement and will keep participants alert and engaged.

[www.smr-project.eu](http://www.smr-project.eu)

## CONTACT

### Tecnun

University of Navarra  
20018 Donostia - San Sebastián  
Gipuzkoa (Spain)

 Smart Mature Resilience Project

Email: [SMRProject@tecnun.es](mailto:SMRProject@tecnun.es)

 Twitter: [@SMR\\_Project\\_eu](https://twitter.com/SMR_Project_eu)



Funded by the  
Horizon 2020 programme  
of the European Union